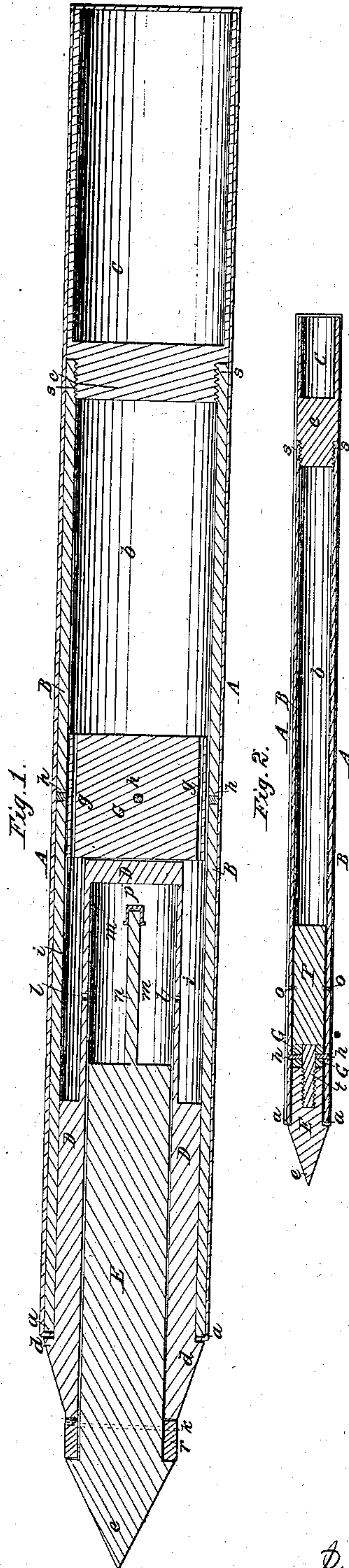


J. N. SMITH.
 ELONGATED PROJECTILE FOR FIREARMS.
 No. 39,593. Patented Aug. 18, 1863.



Witnesses:
J. L. Brown.
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Inventor:
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UNITED STATES PATENT OFFICE.

JOSEPH NOTTINGHAM SMITH, OF NEW YORK, N. Y.

IMPROVEMENT IN ELONGATED PROJECTILES FOR FIRE-ARMS.

Specification forming part of Letters Patent No. 39,593, dated August 18, 1863.

To all whom it may concern:

Be it known that I, JOSEPH NOTTINGHAM SMITH, of the city, county, and State of New York, have invented a new and Improved Arrow Projectile; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a central longitudinal section thereof, arranged as an explosive missile or "shell;" Fig. 2, a similar section thereof as constructed for a simple "arrow" projectile.

Like letters designate corresponding parts in both figures.

In order to fill the bore of the gun, the projectile is cylindrical, except the pointed end of the head which projects out of the gun. This cylindrical portion is composed externally of a hollow cylinder or case, B, and a cylindrical charge-chamber, C, which should properly be made separately from the case B, and then united thereto, as at s. Over these a jacket, A, generally made of cotton or other fibrous substance, knit or woven, thick, soft, and yielding, so as to fit the rifle-grooves of the gun-barrel, is stretched. It is saturated with a compound of beeswax and tallow or any other suitable lubricating substance.

Between the charge-chamber C and the hollow b of the shaft portion of the projectile is a solid partition, e, sufficiently thick and strong to enable the projectile to be propelled by the pressure against it, and to prevent the too rapid communication of heat from the exploding charge through to the hollow b when the latter is filled with powder for exploding as a shell. The front end of the case B is filled with metal, so as to make a head of the required weight for the projectile, and this head is constructed somewhat differently, according as the projectile is to be used—as an explosive missile or as a simple shot. In the latter case, as represented in Fig. 2, the head is simply composed of an iron or steel bolt, E, pointed at e, and of a cylindrical plug, T, of lead, having a screw or shank, t, projecting forward, so that the point-bolt E may be screwed thereon, and there is a stop, G, held in place by pins h, between the bolt and plug, to assist in holding the plug in place, and to cause the bolt to be drawn inward till a shoulder thereon is tightened

against the lapping end a of the jacket A, and thus holds it in place. Pins o o are also driven in through the case B into the plug T, to hold it securely in place. All of the cylindrical case B back of the head makes a hollow shaft of the best form; but when the projectile is to be exploded as a shell the construction is varied from the above, as shown in Fig. 1. First, the shaft-hollow b serves as the magazine, to be filled with the explosive substance. Then immediately forward of that is a strong and thick partition, G, fitting the hollow of the case B and securely held in place by pins h h, or their equivalents, driven in through the case B. In front of the partition G is the head, composed of an outer hollow cylinder, D, fitting in the case B, and of a central point-bolt, E, which fits into the hollow of the cylinder D. The front end of the cylinder D projects somewhat beyond the case B, is partially conical, and has a shoulder, d, to abut against the overlapping end of the jacket A and hold it in place, and to sustain a portion of the shock of the concussion when the projectile strikes. The front cylindrical portion of the cylinder D fits tightly in the case B; but the rear portion is of considerably less diameter, so as to leave a space, i, around it, which is filled with powder. From this chamber vent-apertures g g open back through the partition G into the magazine-chamber b. The cylinder D reaches back to and bears against the partition G. The bolt E is pointed at e, and has a shoulder which bears against a ring, r, of india-rubber or other elastic material, surrounding the bolt behind the shoulder, and bearing at its rear end against the extremity of the cylinder D, substantially as shown. The main portion of the bolt E fills and fits the hollow of the cylinder D; but the rear end terminates in a small cylinder or rod, n, reaching not quite back to the rear end of the cylinder D, substantially as represented. The space or chamber m around this rod is also filled with powder, and has communication with the powder-chamber i through apertures l l in the cylinder D, and on the rear end of the rod n a percussion-cap, p, is placed for exploding the projectile. A pin, k, (shown in dotted lines,) is passed through the india-rubber ring r and bolt E, so that the ring may not yield too readily, and thus allow the projectile to

explode before leaving the gun by the concussion in firing; but this pin is weak enough to yield to the much more violent concussion when the point *e* of the projectile strikes the object. When the projectile strikes, the point *e* enters the object and continues to penetrate it till the concussion breaks the pin *k* and compresses the elastic ring *r* far enough to cause the cap *p* to strike the rear end of the cylinder *D* and explode. This ignites the powder in the chamber *m*, thereby forcing the bolt *E* forward from the cylinder *D* and increasing its penetration. Instantly the ignition of the powder in the chamber *m* communicates through the apertures *l l* to the powder in the chamber *i*, the explosion of which propels the cylinder *D* forward and further increases the penetration. Thence the ignition is communicated through the vent-apertures *g g* to the powder in the main chamber or magazine *b*. This immediately bursts the case *B* at the rear end, where it is weakest, and does its work always in a

forward direction, to the destruction of the object struck.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the point-bolt *E* and cylinder *D*, with their powder-chamber *m* and *i*, arranged so as to ignite the powder therein successively from the concussion of the projectile in striking, substantially as and for the purpose herein specified.

2. The arrangement of the magazine-chamber *b* in the shaft of the projectile, in combination with the powder-chambers *i* and *m*, so as to fire the powder in succession after the firing of the charges in the other chambers, substantially as and for the purposes herein set forth.

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Witnesses:

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